

Cambridge International Examinations

Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY 9700/33

Paper 3 Advanced Practical Skills 1

October/November 2016

MARK SCHEME
Maximum Mark: 40

Published

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Page 2	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark
1(a)	(layout of drawing)	4
	1 quality of line for outer wall of cell thin and sharp + large size;	
	2 only one cell drawn+shows plasmolysis;	
	3 cell wall drawn as two lines close together;	
	4 uses one label line + one label to cell surface membrane;	
1(b)(i)	(decisions on serial dilutions)	3
	1 correct concentrations of 0.5, 0.25, 0.125, 0.0625 + mol dm ⁻³ ;	
	2 shows transfer of 10 cm ³ of 1 mol dm ⁻³ to next dilution + 10 cm ³ transferred from 2nd to 3rd beaker and from 3rd to 4th and from 4th to 5th + cm ³ ;	
	3 adds 10 cm ³ of water to each beaker;	
1(b)(ii)	(recording results)	5
	1 table drawn+heading, concentration+sucrose+mol dm ⁻³ ;	
	2 heading, time + seconds;	
	3 records results for at least four concentrations;	
	4 correct pattern of results, the highest concentration of sucrose recorded as the shortest time for colour change;	
	5 times recorded as whole seconds;	

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Question	Answer	Mark
1(b)(iii)	(records time for U)	1
	appropriate number for time + seconds;	
1(b)(iv)	(interpretation of estimate)	1
	correct answer in accordance with recorded times;	
1(b)(v)	(improvements to procedure)	3
	three from 1 increased number of concentrations;	
	2 between named concentrations or use simple (proportional) dilution;	
	3 repeat or replicate;	
	4 weigh mass of precipitate;	
1(c)(i)	(layout of data)	3
	1 (x-axis) concentration of sucrose solution/mol dm $^{-3}$ +(y-axis) water potential/kPa;	
	2 correct plotting of five points with a small cross or dot in circle;	
	3 five plots joined point to point or as a line of best fit drawn as a ruled thin line;	
1(c)(ii)	(interpretation of concentration)	1
	correctly reads value for the water potential of the concentration of sucrose at $0.66~{\rm moldm^{-3}}$ + minus sign ;	

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Question	Answer	Mark
1(c)(iii)	(conclusions)	2
	1 (cells) reference to higher water potential than solution;	
	2 water moves out of cells ;	
	3 by osmosis;	
	Total:	23

Question	Answer	Mark
2(a)(i)	(decisions)	2
	1 same number of drops or stated number of drops or volume (of sample);	
	2 add same number of drops or stated number of drops or volume (of iodine);	
2(a)(ii)	(recording results)	3
	1 heading, colour or observation ;	
	2 records colour results for three samples ;	
	3 records P2 as darkest blue (or black);	
2(a)(iii)	(conclusion)	1
	P2;	

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Question	Answer	Mark
2(b)	(plan drawing)	5
	1 large size +no shading;	
	2 no cells + at least three lines drawn;	
	3 draws outline of root cap + draws outline of stele;	
	4 stele shown in correct proportion;	
	5 uses one label line + one label, the letter T, to region of cortex;	
2(c)(i)	(actual width of cells)	3
	1 measures length of scale bar+units;	
	2 for calculation shows length of scale bar used with measurements of cells;	
	3 correct answers to calculation for all cells;	
2(c)(ii)	(mean actual width of cells)	2
	1 shows addition of five measurements from (c)(i) + divided by 5;	
	2 correct answer to appropriate degree of accuracy;	
2(c)(iii)	(interpretation)	1
	one observable difference between the cell D and cell E ;	
	Total:	17